AMENDMENTS TO THE DRAWINGS

The attached sheets of drawings, beginning on page 9, include changes to Figures 6-8. The previously omitted "Prior Art" legend designations have been added.

REMARKS

Claims 1 and 4-6 are now pending in this application. By this response to the non-final Office Action dated March 28, 2006, claims 1 and 4-6 are amended, and claims 2, 3, and 7 are cancelled. Care has been taken to avoid the introduction of new matter. Favorable reconsideration of the application in light of the following comments is respectfully solicited.

Objections to the Specification and Claims

As suggested in section 3 of the Office Action, the title for the application has been amended. Despite citations made to specific lines of the application, the Applicants are unable to locate the clerical errors discussed in sections 2, 4, and 5 of the Office Action. Therefore, the Applicants find no cause for amendments based upon these objections.

Rejections Under 35 U.S.C. § 102(b)

In section 7 of the Office Action, claims 1-5 and 7 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent Application Publication No. 2002/0051901 (hereinafter "Zuber"). In response, the Applicants have amended the claims, canceled claims 2, 3, and 7, and respectfully traverse the rejection.

Claim 1 has been amended to include the limitations originally recited in claims 2 and 3. Zuber does not teach all of the limitations as recited in claim 1, and therefore does not anticipate claim 1 under 35 U.S.C. § 102(b). Likewise, claims 4 and 5, which are dependent upon claim 1 and have been amended to reflect the cancellation of claims 2 and 3, are not anticipated by Zuber.

With respect to claim 1, which now recites the limitations previously recited in claims 2 and 3, paragraph 7 of the Office Action points to the AvCarb 1071 HCB fabric disclosed in paragraph 21 of Zubar, and asserts, with no specific factual support, that:

> [i]t is well known in the art that the gas permeability of the carbon fiber fabric in the direction perpendicular to the gas flow direction and parallel to the surface of the separator is smaller than the gas permeability in the gas flow direction

Applicants hereby challenge the Examiner to provide objective evidence in support of this assertion (*see* MPEP § 2144.03). The factual determination of lack of novelty under 35 U.S.C. § 102 requires just that -- facts. As no such facts have been presented, a *prima facie* case has not been established.

Moreover, the physical characteristics of the cited material, AvCarb 1071 HCB, suggest that the assertion is incorrect. Appendix I lists technical specifications for the AvCarb 1071 HCB material (*available at* http://www.ballard.com/resources/carbon_fiber/BMP_AVCARB_FABRICS_10.04.pdf). The material's weave count in the warp direction (17.3-21.3 per cm) is virtually identical to the weave count in the fill direction (16.5-20.5 per cm).[1] This suggests that there is no significant difference in gas permeabilities between the warp and fill directions. Absent evidence to the contrary, Zuber does not anticipate claim 1.

Further, even if a carbon fiber fabric with a differential gas permeability were to be employed, Zubar does not teach disposing said fabric such that the direction with lower gas permeability is parallel to the gas flow direction. Instead, Zubar's teachings are focused on limiting the intrusion of water into the gas diffusion material, and preventing the blockage of the gas flow channels by the intrusion of the gas flow diffusion material into the gas flow channels. As Zuber lacks the recited "gas permeability in the direction perpendicular to the gas flow direction . . . [which] is smaller than the gas permeability is the gas flow direction," it does not anticipate claim 1.

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[1] *See* http://composite.about.com/library/weekly/aa042897.htm ("Fabric Terminology for Composite Materials") :
> "If you look at a roll of fabric, some of the yarns run in the direction of the roll and are continuous for the entire length of the roll. These are the *warp* yarns. The short yarns which run crosswise to the roll direction are called the *fill* yarns. . . . If the [warp] and [pick] counts are roughly equal, the fabric is considered bidirectional"

Claim 4 is dependent upon claim 1, and is therefore not anticipated by Zuber for at least the same reasons as claim 1. Additionally, Zuber teaches away from a fuel cell "wherein the gas flow direction in [the] gas flow channels is approximately parallel to the fiber direction of [the] fibrous elements in [the] gas diffusion layers," as recited in claim 4. In paragraph 19, Zuber specifically teaches orienting "the weave direction of the carbon fiber fabric . . . at an angle α of 20 to 70 [degrees], . . . particularly of 45° to the flow channels" (*see also* claims 4-9 of Zuber). The orientation taught by Zuber is employed in order to reduce the water content of the gas distribution layers and reduce the "penetration of the fabric into the gas distribution channels" (see paragraph 19). The disclosed orientation is deliberately not "approximately parallel" to the gas flow channels, and thus fails to provide an explicit limitation required by claim 4.

The fuel cell disclosed in paragraph 50 of Zuber, cited in section 7 of the Office Action, fails to anticipate claim 4. Paragraph 47 discloses that the fuel cell employed AvCarb 1071 HCB for the gas diffusion material. As discussed previously, this material has identical weave counts in the warp and fill directions. Because of this uniformity, the material lacks a "fiber direction" as defined in this application, and therefore cannot aligned such that "the gas flow direction in [the] gas flow channels is approximately parallel to the fiber direction of [the] gas diffusion layers," as recited in claim 4.

With respect to claim 5, the same arguments applies. Claim 5 is dependent upon claim 1, and is therefore not anticipated by Zuber for at least the same reasons as claim 1. In paragraph 19, Zuber teaches away from the 50% or more areas of all the gas flow channels . . . arranged approximately parallel to the fiber direction of [the] fibrous elements" required in claim 5. Therefore Zuber fails to anticipate claim 5 for failure to teach an explicit limitation recited in

claim 5. Also, because the AvCarb 1071 HCB material lacks a "fiber direction" as defined in this application, the fuel cell detailed in paragraphs 47-51 of Zuber does not anticipate claim 5.

Rejection Under 35 U.S.C. § 103(a)

In section 9 of the Office Action, claim 6 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Zuber in view of U.S. Patent No. 6,444,347 (hereinafter "Ouvry"). The Applicants respectfully traverse the rejection.

Since claim 6 depends on a patentable parent claim, as discussed previously for claim 1, claim 6 is also patentable for at least the same reasons. Additionally, the Office Action presents no motivation to combine the teachings of the two references. It seems that one of the objects of Zuber is to prevent "tenting" (where the gas diffusion layers sink into the passage) by disposing the gas diffusion layer at an angle to the gas distribution channels. There is no suggestion in either reference that the gas flow direction should be "arranged approximately parallel to the fiber direction of 70% or more fibrous elements in said gas diffusion layers facing said gas flow channel," as required by claim 6. Therefore, no *prima facie* case of obviousness can be established.

For the above reasons, the Applicants believe that the application is in condition for allowance. The Applicants respectfully request the Examiner's favorable consideration as to allowance. The Examiner is invited to contact the Applicant's representative listed below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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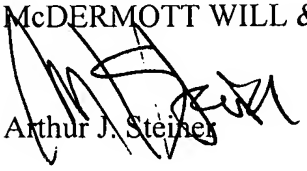

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